encana

April 18, 2012

Office of Environmental Information (OEI) Docket
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460

Re: Encana Oil & Gas (USA) Inc.'s Initial Comments on U.S. Environmental Protection Agency Draft Report "Investigation of Ground Water Contamination Near Pavillion, Wyoming" (December 2011)

Dear Sir or Madam:

On December 14, 2011, the U.S. Environmental Protection Agency ("EPA") published a notice in the Federal Register of the availability of EPA's Draft Report "Investigation of Ground Water Contamination Near Pavillion, Wyoming" ("Draft Report") and of a public comment period for the Draft Report. On March 29, 2012, EPA published a notice in the Federal Register extending the comment period on the Draft Report through October 16, 2012.

During this extended comment period, according to a news release on March 8, 2012, EPA will conduct additional sampling of EPA's two monitoring wells, MW01 and MW02, in cooperation with the State of Wyoming, the Northern Arapaho and Eastern Shoshone Tribes, and the U.S. Geological Service. Encana Oil & Gas (USA) Inc. ("Encana") intends to submit detailed comments and expert reports relating to the entirety of the Draft Report during the comment period and after EPA has provided records requested by Encana and others.

Nevertheless, Encana submits the enclosed expert reports of Dr. Robert J. Sterrett and Mr. Michael J. Mullen in order to address (i) the Draft Report's mischaracterization of the hydrogeology of the Pavillion Field and (ii) serious concerns about the reliability of MW01 and MW02 wells, which were contaminated by EPA's own drilling and completion practices. The contamination of these wells compromised the accuracy of the data on which EPA relied in the Draft Report and will continue to compromise the accuracy of the samples to be taken by EPA from MW01 and MW02 in the near future.

Report by Robert J. Sterrett, Ph.D.

The Draft Report mischaracterizes Pavillion Field hydrogeology in several key respects. First, contrary to conclusions reached in the Draft Report, the Wind River and Fort Union Formations consist predominantly (approximately 80%) of low permeability shales, with higher permeability sandstone accounting for the other 20%; these sandstone lenses, moreover, are discontinuous and relatively small. These discrete sandstone lenses do not provide a pathway for groundwater or contaminant migration across Pavillion Field.

Second, EPA wrongly assumes an upward hydraulic gradient for fluid migration in Pavillion Field in the Draft Report. The hydraulic gradient in this area is well-documented to be downward; importantly, municipal wells for the Town of Pavillion are upgradient of the core area described by Dr. Sterrett and are not impacted by water quality concerns in the Pavillion Field area. Third, the Draft Report does not recognize the hydrogeologic distinction between the shallower Lost Cabin member (or portion) of the Wind River formation (where domestic water wells are drilled and where MW01 was completed) and the deeper Lysite formation (which contains a rich, natural gas producing horizon and where MW02 was completed). As noted in Dr. Sterrett's report, because the

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Lysite member is gas-producing, EPA's detection of hydrocarbons is unsurprising—quite simply, EPA drilled MW01 and MW02 into geologic formations known to contain naturally-occurring hydrocarbons.

Lastly, groundwater quality in Pavillion Field is variable, but typically exceeds secondary, palatability-based standards for total dissolved solids and sulfate. As explained by Dr. Sterrett, these and other natural constituents can negatively impact the taste and smell of domestic well water. These are natural conditions unrelated to oil and gas development. EPA suggests pathways for fluid and gas migration that simply do not exist and the Draft Report is clearly in error on these matters.

Report by Mr. Michael J. Mullen

EPA's drilling and completion practices contaminated MW01 and MW02, thereby compromising the reliability of the analytical data on which EPA's conclusions turn. (It should be noted that according to the Federal Register notice on March 29, 2012, the Draft Report "is not final" and "does not represent and should not be construed to represent Agency policy or views.") To illustrate, the available information documents that EPA, through poor well completion practices, pumped cement slurry (used in well completion) directly into the geologic formation from which water samples were taken at both MW01 and MW02. In addition, neither well was properly designed to isolate the screened interval from cement slurry related impacts to the water bearing zone being tested above and, in the case of MW02, below the screen.

Further, EPA driller records indicate that, at MW02, EPA pumped cement slurry below, through and around the well screens through which water from the geologic formation is sampled and analyzed by EPA laboratories. The high ph levels measured in both MW01 and MW02 is clearly associated with the high pH of the cement slurry.[1] As noted in Mr. Mullen's report, the current condition of the EPA monitoring wells would make it difficult, if not impossible, to rehabilitate these wells to generate accurate groundwater monitoring data.

As discussed, Encana will submit additional, detailed comments and expert reports relating to the entirety of the Draft Report. In the meantime, however, Encana very much appreciates the opportunity to present these comments and reports related to these particular matters.

Sincerely,

ENCANA OIL & GAS (USA) INC.

John Schopp
Vice President, North Rockies Business Unit

cc: Mr. James B. Martin, Regional Administrator
United States Environmental Protection Agency, Region 8

[1] Additionally, although not addressed in Mr. Mullen's report, the detection of diethlylene glycol in EPA's analytical results can be also be attributed to the cement slurry contamination in EPA's wells. An independent analysis of Quickcrete I (cement used by EPA) indicates detections of diethylene glycol in the cement. (See attached laboratory analyses.)

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natural gas

Attachments:
Laboratory Analyses
Report by Robert J. Sterrett, Ph.D.
Report by Mr. Michael J. Mullen

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Glycols by GC/FID

PRELIMINARY RESULTS

Method SW8015GLYCOL Revision B

Sample Results

Lab Name: ALS Environmental-- FC
Work Order Number: 1202278
Client Name: AECOM
ClientProject ID: Drilling Materials 60196941

Field ID: Quikrete 1
Lab ID: 1202278-2

Sample Matrix: SOLID
% Moisture: N/A
Date Collected: 23-Feb-12
Date Extracted: 05-Mar-12
Date Analyzed: 06-Mar-12
Prep Method: METHOD

Prep Batch: HC120305-7
QCBatchID: HC120305-7-2
Run ID: HC120305-7A
Cleanup: NONE
Basis: As Received
File Name: 03125.dat

Analyst: Joel F. Nolte
Sample Aliquot: 10.23 G
FinalV olume: 10 ML
Result Units: UG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
107-21-1	ETHYLENE GLYCOL	1	4900	4900	U	
57-55-6	PROPYLENE GLYCOL	1	4900	4900	U	
111-46-6	DIETHYLENE GLYCOL	1	8000	4900		
112-27-6	TRIETHYLENE GLYCOL	1	4900	4900	U	
112-60-7	TETRAETHYLENE GLYCOL	1	4900	4900	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
504-63-2	1,3-PROPANEDIOL	13300		9780	136	51 - 150

Data Package ID: *HC1202278-1*